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**COMMERCIAL BANK LENDING PRACTICES  
AND THE DEVELOPMENT OF  
BLACK-OWNED CONSTRUCTION COMPANIES**

By

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## ABSTRACT

Although the construction industry has been a tremendous growth industry for black entrepreneurs in recent years, black-owned construction firms, on average, are less than half the size of those owned by nonminorities. Previous findings suggest that limited access to financial capital, particularly bank loans, has restricted the size of black-owned businesses. Examination of nationwide random samples of construction companies reveals that black firms are treated differently than nonminorities when they borrow from commercial banks: they get smaller loans than nonminorities who have otherwise identical traits. Undercapitalization, in turn, is shown to increase the likelihood of firm discontinuance. Alleviation of undercapitalization problems would help promote the development of black-owned businesses in the construction industry.

Keywords: Black business, bank loans, firm discontinuance, construction industry.

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## Commercial Bank Lending Practices and the Development of Black-Owned Construction Companies

### A. Introduction

Recent Census Bureau figures highlight rapid sales and employment growth in many areas of black enterprise, particularly among the large-scale firms (U.S. Bureau of Census, 1990). The construction industry typifies this trend. This progress occurred in the face of commercial bank lending practices that handicapped blacks seeking to create and expand firms in the construction industry.

This study compares the financial capital structures of black and nonminority-owned construction companies at the point of business startup. We estimate econometric models explaining the loan amounts received by blacks and nonminority borrowing from commercial banks to finance entry into the construction industry. Controlling for various borrower traits, differentials in the treatment of blacks and whites are shown to be wide and striking.

Previous studies have found that the amount of financial capital invested by the owner at the point of entry into self-employment is the strongest single determinant of subsequent firm sales levels (Bates, 1991b). Nonminority business owners consistently command more financial capital than black business owners when they enter business, and differentials are widest for debt capital.

Commercial banks constitute the largest single source of debt for business startups in the construction field, and they are less likely to lend to blacks than to white-owned firms (Ando, 1988). When black firms do obtain bank loans, they receive significantly smaller amounts than nonminority borrowers who possess otherwise identical characteristics: education, work experience, age, equity investment in the business startup, and so forth.

Finally, samples of black and nonminority-owned construction company startups are traced over time, and the traits that differentiate firms remaining in business from those discontinuing operations are identified

econometrically. The weaker financial capital base of black firms is associated with their higher discontinuance rates, relative to nonminority-owned construction companies, over the 1982-1986 time period.

B. Rationale for Studying Black-Owned Construction Companies

Black-owned construction firms are interesting both because they have experienced rapid growth in recent years, and because they employ predominantly a minority workforce drawn from labor force segments typified by high unemployment rates. Many traditional lines of black enterprise, in contrast, have experienced little growth (or even outright decline) in recent years. In particular, retail stores with few or no paid employees declined substantially in numbers over the last two decades and the drop was sharpest in fields where black firms had been most concentrated historically: restaurants and food stores. While the traditional black business community consisted predominantly of tiny retail and personal service firms serving a minority clientele, market opportunities in recent years have induced entrepreneurs to establish larger firms that are oriented to serving government and corporate clienteles (Bates, 1985a).

The black business community is undergoing a qualitative transformation: opportunities created in part by the opening of new markets are producing diversification and expansion. Further, emerging industry groups are growing as a result of an influx of entrepreneurial talent and financial capital (Bates 1985b; Bates, 1989). Growth trends of the black-owned construction company group, like those of the emerging industry groups generally, far exceed those of the overall black business community. Whereas the entire black business community increased in number by 37.6 percent between 1982 and 1987, firms in construction grew by 63.7 percent. Black-owned construction companies utilizing paid employees, in contrast, increased by 172.1 percent: from 4,073 firms in 1982 to 11,081 in 1987.

Over 86 percent of the unemployed black males in the United States are

blue collar workers, but a majority of the new jobs being generated by the U.S. economy are in white collar occupations (Bates, 1984). The degree of correspondence between these unemployment patterns and the types of jobs generated in the growing lines of minority business varies greatly from industry to industry. Jobs created by the growth of wholesaling firms, for example, are overwhelmingly white collar. The employment impact of minority construction firm growth is of particular interest because this industry employs a labor force that is predominantly blue collar. Per million dollars of sales, small firms in construction employ over twelve times more blue collar workers than small businesses in wholesaling (Bates, 1984, pp. 79-80). More than any other single major industry group, expansion of minority-owned construction firms creates blue collar jobs, and these firms employ a predominantly minority workforce (Bates, 1988).<sup>1</sup>

Minority business set-aside programs have aided the creation and expansion of thousands of black-owned firms, particularly in the construction industry (Bates, 1985a). Corporations, as well as state and local governments, have emulated federal government preferential procurement programs. Manifestations of this opening of new markets to black businesses include increases in aggregate employment (from 12,535 employees in 1982 to 27,427 employees in 1987) and sales (from \$491.0 million in 1982 to \$2,174.4 million in 1987) among black-owned construction firms (U.S. Bureau of the Census, 1990).

Yet, black firms in growth areas such as construction continue to lag behind nonminority businesses. First, access to financial capital -- although expanded since the late 1960s -- has historically been constrained for black entrepreneurs (Bates, 1991a). Black construction firms in 1987 (36,763 in all) accounted for 2.2 percent of all construction firms nationwide (U.S. Bureau of the Census, 1990). But the two billion dollars plus in receipts generated in 1987 by blacks in this industry comprised less than one percent of the \$232.4 billion in total revenues earned by all construction firms (U.S.

Bureau of the Census, 1990). Construction companies account for 12.1 percent of all U.S. firms, but blacks in construction represent a smaller 8.7 percent of all U.S. black-owned businesses in the U.S. (U.S. Bureau of the Census, 1990).<sup>2</sup> Despite impressive progress, construction firms owned by blacks are substantially smaller, on average, than their nonminority cohorts; they are relatively less numerous, undercapitalized, and more likely to go out of business.

### C. Empirical Analysis of Financing Construction Company Startups

#### 1. The Data Base

The samples of small businesses analyzed in this section are drawn from the Census Bureau's Characteristics of Business Owners (CBO) survey. This unique data base contains detailed data on the traits of over 80,000 small businesses, as well as the traits of the owners of these firms. Construction firms owned by whites and blacks (other minorities such as Hispanics and Asians are excluded) are included here if they met two criteria: (1) 1982 sales were at least \$5000, and (2) missing variable problems were not severe.<sup>3</sup>

The resultant samples of 1,270 nonminority and 554 black-owned construction companies are examined regarding: (1) financial capital structure; (2) loan size determinants; and (3) business survival over the 1982-late 1986 time period. Most of the sampled firms operated in urban locations: 75 percent of the black and 63 percent of the minority-owned construction firms were located in areas classified as Standard Metropolitan Statistical Areas (SMSAs).

Financial capital variables -- debt and equity investments -- are measured solely at the point of business startup in the CBO data base; figures are therefore inflation adjusted to 1982 dollars. "Equity" measures the net worth of the small business and includes the cash value of nonfinancial tangible assets that the owner has contributed to the firm: "debt" includes short-term and long-term indebtedness. See the Appendix 1 for further details on data base creation and variable definitions.

## 2. Business Startups: Financial Capital Structure

Table 1 subdivides the samples of nonminority and black-owned construction companies into two groups in order to highlight the traits of commercial bank loan recipients. For blacks and nonminorities alike, bank loans are the most common type of debt financing; among all borrowers, 67 percent of nonminorities and 65 percent of blacks used some form of bank credit to finance their entry into the construction industry. Bank loans were over twice as frequent as the other major source of startup debt: family and friends. Mean financial investments were much larger for the bank borrowers -- relative to other borrowers as well as nonborrowers -- but particularly large differentials characterize the black and nonminority bank loan recipients. Bank borrowers who are black reported median indebtedness of \$3257, about one-third the size of the \$9,713 figure reported by nonminorities (Table 1); corresponding mean figures (skewed by several outliers) reveal much larger black/white debt differentials. Table 1's data reveal that blacks enter the construction field with consistently less financial capital than nonminorities:

1. blacks acquire their construction firms with less than 40 percent of the mean \$22,227 financial investment reported by nonminorities;
2. individuals entering self-employment in construction frequently invest very little financial capital into their ventures, but tiny investments are more common among blacks - 65.7 percent of whom enter with less than \$5000 -- than nonminorities;
3. differentials are widest in the case of debt: blacks are less likely to borrow than nonminorities and when they do borrow, their loan amounts average less than those reported by white construction firms.

## 3. Explaining Loan Amounts Extended by Commercial Banks

This section addresses the issue of whether differential treatment of black and nonminority borrowers might be responsible for the smaller loan

amounts received by black-owned construction firms. Recent research (Ando, 1988; Bates, 1991a) has found that black business owners are differentially restricted from obtaining commercial bank financing.

Multiple linear regression equations are estimated in this section to examine relationships between the dollar amount borrowed by bank loan recipients and three types of explanatory variables: (1) owner equity capital investment, (2) owner human capital traits, and (3) owner demographic traits.

Considerations of both supply by the lender and demand by the borrower are relevant to loan amount decisions; this econometric approach reflects judgments about which factor will dominate. Evans and Jovanovic (1989), for example, illuminate supply side lending constraints in their recent theoretical and empirical work. They show that most individuals who enter self-employment face a limited access to debt; as a result, they are forced to use suboptimal amounts of capital which result in a high incidence of undercapitalized small businesses.

The common situation of suboptimal business access to debt is explored theoretically by the Stiglitz and Weiss (1981) study of equilibrium loan volume. They argue that imperfect information makes it difficult for banks to determine the risk of individual borrowers. The resultant commercial bank equilibrium coexists with both credit rationing and a group of firms which have lower than optimal leverage (debt divided by equity) ratios. A study by Scott and Dunkelberg (cited by Evans and Jovanovic) reported that very small businesses received, on average, only 50 percent of their initial loan request.

As noted earlier, the debt and equity capital variables are expressed in 1982 dollars. In the model discussed below, larger equity inputs are expected to result in larger loans; debt and equity are hypothesized to be complements rather than substitutes. Although weaker borrowers may have a greater demand for credit -- particularly to overcome equity capital deficiencies -- risk averse commercial bankers are expected to cut loan amounts for the less

attractive borrowers.

Units of measurement for demographic and human capital variables are defined below.<sup>4</sup>

Ed2: for owners completing four years of high school, the value of Ed2 = 1; otherwise Ed2 = 0.

Ed3: for owners completing at least one but less than four years of college, the value of Ed3 = 1; otherwise Ed3 = 0.

Ed4: for owners completing four or more years of college, the value of Ed4 = 1; otherwise Ed4 = 0.

Management experience: for owners who worked in a managerial capacity prior to owning the business they owned in 1982, mgmt = 1; otherwise mgmt = 0.

Ownage: the age of the owner measured in years.

Ownage squared: the squared value of the ownage variable.

Method of acquiring the business: if the owner acquired a business that was already in operation, ongoing = 1; if the owner was the original founder of the business, ongoing = 0.

Family business ownership: for owners whose close relatives (mother, father, brothers, sisters, others with whom frequent contact was maintained) either owned a business or were self-employed in professional practice, FBO = 1; otherwise FBO = 0.

The choice of owner human capital and demographic traits for inclusion in this study's econometric equations is shaped by previous theoretical and empirical work on entrepreneurship and small business behavior. A model developed by Jovanovic (1982) analyzes the impact of uncertainty about entrepreneurial abilities on the behavior of young firms. Those who enter self-employment gradually learn about their managerial talent by engaging in the actual running of a business and observing how well they do. As they learn more about their abilities, their entrepreneurial behavior changes: those who revise their ability estimates upward tend to expand output, while those who revise their estimates downward tend to contract or dissolve their

businesses. Over time, surviving entrepreneurs acquire precise estimates of their abilities; younger firms exhibit relatively more variable behavior because they have less precise estimates of their true abilities. Entry into an ongoing business, therefore, is expected to be associated with increased viability. Purchasing an ongoing business may permit a new owner to capitalize upon established managerial procedures. Consistent with Jovanovic's model, the new owner who is unsure of his managerial abilities may reduce uncertainty by buying into a firm which embodied the managerial practices of previous owners. Holmes and Schmitz (1990) develop a model which predicts that, within a cohort of new firms started at a given date, those that are subsequently sold to new owners will on average survive longer than those that are not transferred. Ravenscraft and Scherer (1987) also have concluded that transferred firms generally experience superior performance.

A recent study of entrepreneur earnings reported that the 35-55 age bracket was most strongly associated with business viability. This strong association drops off sharply for owners beyond age 60 (Bates, 1987). Besides age, previous studies have found that surviving firms tend to be established by highly educated owners (Bates, 1990b) and those possessing managerial experience (Bates, 1973a). Thus, education and managerial experience are both hypothesized to be positively associated with business viability.

Finally, the family business background characteristic has been linked repeatedly by sociologists and psychologists to entrepreneurial ability. Albert Shapero, (1975), for example, found that more than 50 percent of the entrepreneurs he studied had self-employed fathers.

To summarize, loan amount determination is assumed to be a supply-side (i.e. banker) dominated decision for small business startups. Lenders such as commercial banks are hypothesized to approve larger loans to borrowers who are investing relatively greater amounts of equity capital into their business ventures. Further, owners possessing attributes that are positively associated with business viability are expected to receive larger loans;

positive traits include owners who lie in the middle (as opposed to the tails) of the age distribution, those entering ongoing firms, those who possess managerial experience as well as strong educational backgrounds, and those with family business backgrounds.

The results of the regression presented in Table 2 indicate broadly that equity capital is the only determinant of loan size that matters consistently for both black and white borrower groups. Further, the coefficients of the equity variables provide a clear explanation of loan size differences by race. The nonminority business borrower receives \$3.05 in debt capital per dollar of equity capital, other things equal, while the black business borrower generates only \$0.06.<sup>5</sup> The corresponding standard errors indicate that these estimates are quite precise: a dollar of equity has over 50 times the power to generate loan dollars for nonminorities than it does for blacks. The regression equations explaining the debt levels of construction firm borrowers suggest that possession of four or more years of college (ed4) is generously rewarded with larger loan sizes if the borrower is white, but not if the borrower is black. The only black borrower trait other than equity that is statistically significant is the buyout characteristic (ongoing variable) which is not significant for nonminority borrowers.

Table 3 indicates that the average debt levels of black and nonminority bank loan recipients were \$7,717 and \$56,171, respectively. One hypothesis is that these differences reflect differing factor endowments in the black and white owner samples regarding such loan size determinants as equity capital. This hypothesis was tested by pooling the nonminority and black owner samples and reestimating the linear regression equations reported in Table 2, including an explanatory variable reflecting owner race equal to one for blacks and zero for whites. The coefficients estimates for the pooled equation suggest that black owner commercial bank loan recipients, *ceteris paribus*, receive \$49,156 less than their nonminority cohorts. The pooled equation attributes none of the lower black owner bank loan sizes to borrower

trait differences; the main finding is that blacks receive smaller bank loans than whites who possess otherwise identical education, age, and equity capital traits.<sup>6</sup>

Black construction owners clearly receive smaller loans from banks than nonminority construction owners. The reasons for this differential treatment are unclear, but it maybe that constrained access to debt financing restricts firm size for those black-owned firms that received bank loans. The bank behavior described in Table 2 could possibly be rooted in the perception that black construction businesses are riskier than those operated by whites. Direct insights into this issue emerge from section D's analysis of firm survival (see below).

#### D. Analysis of Small Firm Survival

The discriminant analysis exercises described in Table 4 and 5 attempt to clarify the relationships between firm viability and owner financial capital investments, human capital, and demographic traits. The dependent variable measure of firm viability is, by definition, whether or not the 1982 business is still operating in late 1986. Businesses that continue to operate are referred to as "active" firms; otherwise, businesses are designated as "discontinued." Firms that have undergone a change in ownership are included in the active group. The explanatory variables utilized Table 4 include all human capital and age variables used in Table 2, the ongoing firm status variables, and four new variables defined below:

Log Capital: the logarithm of total capital at startup (the sum of debt and equity).

Leverage: the ratio of debt to equity capital (constrained not exceed 19).

Year Business Acquired: the number of years that the owner has owned the 1982 firm.<sup>7</sup>

Year Business Acquired Squared: the squared value of the "year business acquired" variable.

This section's discriminant analysis uses the sum of debt and equity, rather than the separate debt and equity components. Whereas equity and debt each assume zero values with nontrivial frequency, their sum is commonly greater than zero and their sum, capital, can be expressed in log form as an explanatory variable.<sup>8</sup> The issue of possible black business underfinancing is investigated by introducing the leverage variable as a determinant of firm survival.

Theorists have produced contradictory hypotheses about the impact of debt financing on firm viability. Clearly, borrowers suffer when incremental debt capital inputs fail to generate returns exceeding borrowing costs. Modigliani and Miller (1963) have shown that a corporate tax system with interest payment deductibility creates a situation where the value of the firm is an increasing function of its debt-total value ratio. Others have claimed a downside for increased use of debt financing: the present value of expected costs associated with potential future bankruptcy also increase (Brennan and Schwartz, 1979). On balance, at low leverage, firm viability commonly increases as leverage increases; at high leverage, firm viability declines as leverage increases, suggesting that an interior optimal leverage ratio exists (Van Horne, 1989). In other words, firm longevity is commonly maximized when firms utilize debt financing in moderation.

Articles by Jovanovic (1982), Evans (1986), Bates and Nucci (1989), and Bates (1973) show that small firm discontinuance is heavily concentrated among the youngest and smallest of the small business universe. Further, Evans and Jovanovic (1989) demonstrate that a positive correlation exists between business viability and initial firm capitalization levels. Constrained firms start with suboptimal amounts of capital, they argue, and are therefore smaller than unconstrained firms. Among the black and nonminority owned construction companies analyzed in this study, 1982 mean sales levels were \$74,220 (nonminorities) and \$46,914 (blacks), which is consistent with the hypothesis that capital constrained firms are smaller than unconstrained

firms. In addition, the black construction firms were somewhat more likely to discontinue over the 1982-1985 time period than their white cohorts.

#### 1. Discriminant analysis

The objective of the discriminant analysis is to weigh and combine the explanatory variables in a fashion that forces the groups to be as distinct as possible. The exercise is successful in the sense that the active and discontinued firms are shown to be statistically distinct. Discriminant function standardized coefficients are reported in Table 4; these coefficients permit comparisons of the relative strength of the independent variables in differentiating surviving from discontinued firms. For both black and nonminority-owned firms, the age of owner and year business acquired variables are quite strong (Table 4). The youngest owners are less likely to survive, but growing older is related to survival in a nonlinear fashion: being very old is associated with firm discontinuance (likely due to retirement or sale). Examination of the raw discriminant function coefficients indicates, for example, that black owners in their late 40s are the ones whose businesses are most likely to remain active; beyond owner age 60, discontinuance increases rapidly. Regarding year business acquired among black owners, very young firms as well as those owned for over 20 years are the ones most likely to discontinue operations. Among the remaining explanatory variables, only log capital is consistently strong for delineating business survivors from exits for both the nonminority and black business groups.

A strong and persistent finding is that additional investment of financial capital -- whether equity or debt -- increases the likelihood of firm survival for both black and nonminority-owned construction firms. The fact that the leverage variable shows a direct relationship to firm viability (stronger for blacks, weaker for whites) is particularly noteworthy. While the positive leverage variable coefficients (Table 4) are consistent with the Evans and Jovanovic (1989) findings of capital constraints for small business startups in general, the fact that the coefficients are larger for black

businesses supports the Ando (1988) and Bates (1991a) findings that these constraints impact blacks more severely than whites. The leverage statistics in Table 4 suggest that stronger borrowers receive larger loans: discontinued firms as a group are much less highly leveraged than the active firm groups.

This evidence suggests the following scenario: the more viable firms at startup have greater access to debt: (1) they borrow more heavily than their weaker counterparts; (2) they create larger scale operations; and (3) they are more likely to be active firms in late 1986. Particularly among black owners, the discontinued firms as a group borrow less than the active firms.

Other explanatory variables produce divergent, generally weak results for black and nonminority firms in the discriminant analysis exercises. The family business ownership variable, for example, produced differing results. In the black sample, coming from an environment where one's close relatives were self-employed is associated with less business viability, whereas in the nonminority sample, the association is positive. The conventional wisdom about children of small business owners pursuing self-employment successfully should not be generalized universally across minority groups.

Purchasing an ongoing business may be a shortcut to business viability for black construction firms, but this finding is tentative: less than ten of the discontinued black firms (Table 4) are buyouts. Finally, the human capital variables -- education and managerial experience -- show little explanatory power for delineating active from discontinued construction firms. This finding contrasts sharply with previous studies. For example, Bates (1990b) finds that education levels are more important than any other owner trait for identifying surviving firms.

Failure to confirm positive consistent relationships between owner human capital and firm viability may be rooted in the peculiar nature of the construction industry. This industry is characterized by a high degree of job bidding and subcontracting; successful owners are more often older individuals who have developed the networks and contacts to bid successfully on jobs.

Entrepreneurial (managerial) skills are acquired as subcontractors "learn" how to manage from the contractors. Education beyond high school is less important, because human capital is developed through vocational education, apprenticeship programs, and on-the-job training (Piore, 1986).

A new set of owner human capital variables that may be more appropriate to the construction industry is defined below. The discriminant analysis equations of Table 4 are reestimated, substituting the following variables for ed2, ed3, ed4, and management:

Yemexp: employment experience of the owner prior to entering the current construction firm, measured in years.<sup>9</sup>

Yempsq: years of employment experience squared.

Ed: for owners completing four or more years of high school, the value of Ed = 1; otherwise Ed = 0.

Table 5 reports the results of the reestimated discriminate functions.<sup>10</sup> The findings indicate that substitution of years of employment experience as a measure of owner human capital results in more precise discriminant functions for blacks but the change for the nonminority construction firms is minor. Years of employment experience is clearly more strongly linked to black owner survival in the construction industry than it is among nonminorities. For blacks, a strong, positive relationship exists between the likelihood of firm survival and the years of owner work experience; beyond 25 years of work experience, however, incremental years have little effect on firm discontinuance. Beyond 30 years, a negative relationship predominates among both the black and white firms; work experience beyond 30 years indicates an increasing likelihood of firm discontinuance, undoubtedly because two factors -- declining efforts associated with old age and, ultimately, retirement -- counterbalance the positive effects of accumulated human capital rooted in extensive work experience. For blacks as well as nonminorities, the education factor continues to be a minor one and the pattern of coefficients attached to the other explanatory variables is altered minimally.

We conclude, therefore, that the set of owner human capital variables traditionally used to identify viable small businesses is inappropriate in the case of the construction industry. This finding raises the question of the appropriateness of the human capital variables utilized as explanatory variables in Table 2's analysis of loan size. When the variables measuring years of owner employment experience were introduced into the Table 2 regression analysis, however, they had no power whatsoever as determinants of loan size; banks appear to ignore this factor in their loan determination deliberations.<sup>11</sup>

As a final exercise, we re-estimated Table 5's discriminant functions as logistic regressions for the purpose of testing the robustness of our econometric findings. In contrast to discriminate analysis, which determines whether the group of explanatory variables is able to differentiate statistically active from discontinued firms, the logit analysis of firm survival provides a test of the statistical significance of the individual explanatory variables. The logit technique identified five explanatory variables that, at a 5 percent level, were statistically significant predictors of firm survival among the black construction firms: year business acquired and the corresponding squared term, years of employment experience and the corresponding squared term, and the log of total financial capital.<sup>12</sup>

#### E. Concluding Remarks

We noted on the first section of the paper that commercial banks were the largest single source of debt financing for small businesses formed in the construction industry by black and nonminority owners. Utilizing samples of firms that are broadly representative of the small business universe in construction, we found that banks extend generally smaller loan amounts to blacks than to nonminorities who possess identical borrower traits, including age, education, equity investment, and other factors.

Our analysis of 286 owners entering into construction self-employment

who used commercial bank financing to facilitate business entry and formation does not, by itself, prove that banks are discriminating against black-owned business. Our findings gain significance in conjunction with related findings, such as Ando's 1988 study, which showed that blacks, controlling for borrower risk, are less likely to have their business loan applications approved than other business borrowers. Secondly, initial capitalization is the strongest single determinant of annual sales volume among young firms (Bates, 1991b). Further, Bates (1991a) has shown that an erasing of loan size differentials - treating black borrowers as nonminorities - leads to higher expected survival rates among black business loan recipients generally.<sup>13</sup>

How do all of these findings fit together? First, firms started with little financial capital -- whether black or nonminority-owned -- are more likely to discontinue operations and they achieve lower levels of sales, relative to their cohorts. Ando's findings of disproportionate loan rejection for black businesses suggest a black business community of smaller firms typified by higher failure rates, relative to their nonminority cohorts. Our findings -- smaller loans received by those black owners who do receive bank financing -- similarly suggest smaller, more exit-prone black businesses. These two effects are additive: 12.5 percent of the black business startups analyzed in this study received bank financing, versus 17.1 percent of the nonminorities; among bank loan recipients only, median loan amount was three times larger for the nonminorities. By limiting sales revenues and increasing the likelihood that firms will close down, financial constraints indeed thwart black business progress in construction.

Banker caution appears to be one factor limiting credit market access for black business owners in construction. The stronger borrowers receive the larger loans, and we observe empirically that high leverage is associated with business survival, rather than an increased likelihood of discontinuance. This lender aversion to blacks may undermine some potentially viable black-owned construction firms. Alleviation of undercapitalization problems may

help promote the development of black-owned businesses in the construction industry.

TABLE 1

**Financial Capital Structure Figures for  
Small Businesses in the Construction Industry\***  
(mean values unless otherwise stated)

	<u>Black-Owned Firms</u>	<u>Nonminority-Owned Firms</u>
A. <u>All Firms</u>		
Total financial investment (TFI)		
at startup	\$8605	\$22,227
Debt only	\$1608	\$11,153
Equity only	\$6997	\$11,076
% of firms started with		
under \$5000 TFI	65.7%	
53.9%		
n	554	1270
B. <u>Bank Loan Recipients</u>	<u>Black-Owned Firms</u>	<u>Nonminority-Owned Firms</u>
	<u>mean</u> <u>median</u>	<u>mean</u> <u>median</u>
Debt only	\$ 7,717    \$ 3,257	\$56,171    \$9,713
Equity only	\$15,975    \$ 2,363	\$15,618    \$4,553
% of firms started with		
under \$5000 TFI	34.8%	17.5%
% of firms receiving bank loans	12.5%	17.1%
n	69	217

\*The sample consists of CBO black and nonminority construction firms in the two-digit SIC categories 15-17, as well as those in SIC category 6552.

**Table 2**  
**Linear Regression Equations Explaining Debt for**  
**Construction Firms that Borrowed from Banks**

Variable	<u>Nonminorities</u> Regression Coefficient (standard error)	<u>Blacks</u> Regression Coefficient (standard error)
Constant	-179782.10 (165607.37)	7415.93 (29532.99)
Ed2	- 199.52 (32108.98)	- 223.43 (3334.93)
Ed3	58282.41 (39591.12)	-5461.39 (4345.02)
Ed4	77904.66* (45704.77)	-6807.05 (4251.92)
Ownage	7627.83 (7767.16)	- 1.70 (1324.70)
Ownage squared	- 83.19 (89.34)	0.80 (14.51)
Equity Capital	3.05* (.30)	0.06* (.01)
Management Exp.	5059.77 (25823.96)	-3658.67 (2113.42)
Family Bus. Ownership	3566.94 (27398.03)	2008.42 (3740.15)
Ongoing	-1758.76 (38768.03)	7974.19* (4595.76)
n	217	69
$\bar{R}^2$	.36	.21
F	14.02	3.06

\*statistically significant, " = .05

Table 3

Mean Values of the Dependence Explanatory Variables Used in the  
Table 2 Regression Analysis: for Bank Borrowers Only and  
for the Entire Construction Firm Sample

<u>Variable</u>	<u>Bank Borrowers Only</u>		<u>All Construction Firms</u>	
	<u>Black</u>	<u>Nonminority</u>	<u>Black</u>	<u>Nonminority</u>
Debt	7717.1	56171.0	1607.6	
11152.9				
Ed2	.217	.429	.309	.446
Ed3	.174	.203	.182	.201
Ed4	.130	.124	.072	.120
Ownage	44.3	42.4	45.6	41.2
Ownage Squared	2052.6	1919.2	2199.3	1821.0
Equity Capital	15974.5	15618.1	6997.3	11067.4
Management Exp.	.377	.484	.375	.467
Family Business Ownership	.174	.364	.177	.365
Ongoing	.087	.124	.078	.099
n	69	217	554	1270

TABLE 4A

DISCRIMINANT ANALYSIS DELINEATING ACTIVE FROM  
DISCONTINUED WHITE CONSTRUCTION FIRMS

<u>Variable</u>	<u>Discriminant Function</u>	<u>Group Mean Vectors</u>	
	<u>Coefficients</u> (Standardized)	<u>Active</u>	<u>Discontinued</u>
Ed2	- .093	.436	.478
Ed3	.001	.205	.187
Ed4	.064	.124	.107
Management	- .135	.461	.485
FBO	.176	.374	.338
Ownage	3.225	41.529	39.988
Ownage Squared	-3.340	1842.728	1753.309
Log Capital	.303	6.086	4.918
Leverage	.035	2.087	1.574
Ongoing	- .034	.097	.107
Year Business Acquired	1.226	5.065	3.640
Year Business Acquired Squared	- .592	41.406	24.076
n	1270	971	299

Multivariate test for differences between the two groups:

canonical correlation = .222  
 approx. standard error = .026  
 likelihood ratio = .951  
 F = 5.44, indicating that the group differences are statistically  
 significant  
 " = .01 level.

TABLE 4B

DISCRIMINANT ANALYSIS DELINEATING ACTIVE FROM  
DISCONTINUED BLACK CONSTRUCTION FIRMS

<u>Variable</u>	<u>Discriminant Function</u>	<u>Group Mean Vectors</u>	
	<u>Coefficients</u> (Standardized)	<u>Active</u>	<u>Discontinued</u>
Ed2	.139	.322	.267
Ed3	.061	.177	.200
Ed4	- .004	.067	.089
Management	.033	.375	.378
FBO	- .104	.167	.207
Ownage	3.329	45.91	44.789
Ownage Squared	-3.499	2211.820	2162.754
Log Capital	.286	4.165	2.961
Leverage	.095	1.220	.685
Ongoing	.129	.084	.059
Year Business Acquired	1.916	5.356	3.770
Year Business Acquired Squared	-1.377	42.562	29.248
n	554	419	135

Multivariate test for differences between the two groups:

canonical correlation = .311  
 approx. standard error = .038  
 likelihood ratio = .903  
 F = 4.82, indicating that the group differences are statistically  
 significant  
 " = .01 level.

TABLE 5A

DISCRIMINANT ANALYSIS DELINEATING ACTIVE FROM  
DISCONTINUED WHITE CONSTRUCTION FIRMS

<u>Variable</u>	<u>Discriminant Function</u>	<u>Group Mean Vectors</u>	
	<u>Coefficients</u> (Standardized)	<u>Active</u>	<u>Discontinued</u>
Ed	.023	.769	.772
FBO	.183	.381	.345
Yempexp	.264	14.148	13.757
Yempsq	- .227	264.099	254.220
Log Capital	.452	6.134	4.833
Leverage	.050	1.906	1.463
Ongoing	- .026	.097	.103
Year Business Acquired	1.461	5.05	3.63
Year Business Acquired Squared	- .742	41.38	23.97
n	1233	943	290

Multivariate test for differences between the two groups:

canonical correlation = .195  
 approx. standard error = .027  
 likelihood ratio = .962  
 F = 5.39, indicating that the group differences are statistically significant  
 " = .01 level.

TABLE 5B

DISCRIMINANT ANALYSIS DELINEATING ACTIVE FROM  
DISCONTINUED BLACK CONSTRUCTION FIRMS

<u>Variable</u>	<u>Discriminant Function</u>	<u>Group Mean Vectors</u>	
	<u>Coefficients</u> (Standardized)	<u>Active</u>	<u>Discontinued</u>
Ed	.101	.571	.565
FBO	- .173	.168	.214
Yempexp	1.42	14.216	13.821
Yempsq	-1.51	268.762	274.704
Log Capital	.301	4.225	3.034
Leverage	.071	1.183	.649
Ongoing	.171	.087	.061
Year Business Acquired	2.027	5.28	3.76
Year Business Acquired Squared	-1.511	41.70	29.40
n	523	392	131

Multivariate test for differences between the two groups:

canonical correlation = .293  
 approx. standard error = .040  
 likelihood ratio = .914  
 F = 5.34, indicating that the group differences are statistically  
 significant  
 " = .01 level.

**APPENDIX 1**  
**THE CHARACTERISTICS OF BUSINESS**  
**OWNERSHIP DATABASE**

Constructed by the Census Bureau from the 1982 economic censuses and a mail-out/mail-back questionnaire, the 1982 Characteristics of Business Owners (CBO) data base contains five self-contained samples of 25,000 small business owners:

Panel One: Hispanic

Panel Two: Other Minority (predominantly Asian)

Panel Three: Black

Panel Four: Female (minority and nonminority)

Panel Five: Nonminority male

The data examined in this study are drawn solely from panels three and five.

The CBO contains three categories of variables capturing: (1) personal data about all business owners of a firm, such as age, education, family business background, and marital status; (2) information reflecting owners' involvement in the business, such as hours worked and debt and equity capital investments at the point of business startup; and (3) information on the business itself, such as location, employment, receipts, and legal form of organization. With the exception of sales, employment, payroll, and years of schooling completed, all variables in the database are interval variables rather than point estimates. For example, the owner was not asked his or her age, but to which one of six age categories he or she belonged. "Continuous" measures can be obtained by taking the midpoint of the interval category of a variable.

Besides education and owner age, personal data on business owners include employment experience and prior business ownership experience. Labor force experience is measured quantitatively two ways: as the interval category capturing the number of years of employment experience before entering business ownership (e.g., less than 2, 2-5, 6-9, and so forth) and (2) as the interval category capturing the employment years spent in a managerial capacity. Previous exposure to small business is captured by questions on (1) small business

exposure within one's family, and (2) whether any other business was owned prior to the one owned in 1982.

Information about the dollar amount of financial capital an owner used to acquire a business is in nominal terms in the CBO; businesses were acquired by owners in different years. These nominal dollar estimates were converted into constant 1982 dollar estimates by using CBO information on the year the business was acquired, as well as the GNP deflator for personal income. Other variables pertaining to the owner's financial investment in the business include the sources that provided both debt and equity capital: commercial banks, family, friends, former owners, and so forth.

Although the CBO data base consists entirely of small businesses that were operating in 1982, the survey questionnaire was not mailed out until late 1986. A powerful question -- "Is the business you owned in 1982 still operating?" -- was therefore added as an attempt to quantify small business discontinuance rates. Inclusion of this piece of information enables investigation of the relationships between firm survival and owner human capital, as well as other owner and firm traits.

The CBO database is national in scope and includes information on state, metropolitan area, and zip code. In addition, industry classifications for each observation are available at the two- and four-digit levels. The 1972 Standard Industrial Classification (SIC) Manual was used to classify firms in the CBO. All industries in the SIC system, except agricultural production and railroads, are represented in the CBO.

The CBO survey is unlike any other large scale small business survey undertaken to date. Other data sources, such as the public use samples from decennial population census data, describe self-employed people as individuals. Periodic economic census data (conducted in the years ending in 2 or 7), describe business establishments. The CBO survey is the first very large database that describes self-employed people as individuals as well as describing traits of businesses owned by these individuals.

The CBO survey went to 125,000 business owners; approximately 80 percent responded, yielding a sample of some 100,000 small business owners attached to 90,000 firms. Item nonresponse is under five percent for most survey questions; the exception is the question on firm net income in 1982. While the unit of observation in the CBO database is technically the owner, firm identification numbers are available so that the unit of observation can be transformed into the firm.

The CBO survey drew its sample from the 1982 Surveys of Women-Owned Business Enterprises (WOB) and Minority-Owned Business Enterprises (SMOBE); these surveys were drawn in turn from the universe of persons who filed one of the following income tax returns in 1982: Schedule C, form 1040 (sole proprietorships); Schedule 1065 (owners of partnerships); and Schedule 1120S (owners of subchapter S corporations). Excluded from the mailout were businesses with less than \$500 of annual sales, non-resident U.S. business owners, and corporations and partnerships with more than ten partners or shareholders.

Sole proprietorships dominate the CBO population. Among the construction firms analyzed in this study, for example, the distribution of firms, by legal form of ownership, was:

	<u>Black</u>	<u>Nonminority</u>
corporation	2.0%	4.0%
partnership	3.3%	7.4%
sole proprietorship	94.8%	88.6%
n	554	1270

The numerous sole proprietorships present in the CBO data base are much smaller, on average, than the corporations and partnerships. Using the 554 black and 1270 nonminority construction firms, once again, as an illustrative example, mean 1982 sales figures were:

	<u>Black</u>	<u>Nonminority</u>
corporation	\$318,052	\$394,245
partnership	\$117,291	\$213,442
sole proprietorship	\$ 38,820	\$ 48,080
n	554	1270

Note, however, that the legal form of ownership trait should be thought of as

endogenous: corporations have high mean sales because they are working with larger amounts of capital and labor, relative to proprietorships. High levels of capital investment - not corporate status -- lead to high firm sales levels (Bates, 1991b, ch. 3).

One problem inherent in the design of the CBO data base stems from the fact that self-employment and small business ownership are not synonymous. To a person who hosted a Tupperware party five years ago, the question "how did you acquire ownership of this business?" is apt to be confusing. Self-employment activities are peripheral to many people whose main labor force status is "employee". Particularly among persons filing schedule C income tax forms, many are operating "casual" businesses. Quite frequently, these casual business owners have invested no financial capital into their "firms", and their revenues from self-employment are low. Over half of the observations report 1982 sales of under \$10,000. Low sales are most pronounced in the female business panel, where 49.7 percent of the overall sample reports 1982 sales of less than \$5,000. The technique used in this study for deleting casual businesses -- typically employees who have periodic self-employment income -- is to define small business firms as the subset of the CBO sample for which annual sales in 1982 are at least \$5,000. Applying this restriction reduces the number of observations in each CBO panel by at least 30 percent.

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#### ENDNOTES

1. Minority employees made up 75 percent or more of the workforce at 82.4 percent of the black-owned construction firms in 1982; only 3.2 percent of the firms with paid employees had no minority workers. Among the nonminority-owned construction firms, in contrast, 60.5 percent of them had no minority workers, and 18.2 percent of those using paid employees had 75 percent or more minority employees (Bates, 1988).
2. The figures in this section are drawn from pages 7 and 62, U.S. Bureau of the Census, 1990.
3. Nearly 20% of the observations were dropped due to missing variable problems.
4. In the econometric exercises in Tables 2, 4, and 5, the dummy education or variable groups excludes owners with less than 12 years of formal schooling.
5. The debt and equity capital variables were also transformed into natural logs. Substitution of the log form of these variables in Table 2's regression exercises produced nearly identical, but less precise, results.
6. Comparison of the residual sums of squares from the pooled equation versus the separate black and nonminority equations indicates that the separate models explain loan size significantly more accurately in an analysis of covariance.
7. The year business acquired variable was drawn from responses to the CBO survey that were in interval form. For Example, the survey asked, "When did you acquire the ownership or your portion of the ownership of the (1982) business?" Respondents checked one of seven categories: before 1960, 1960-1969, 1970-1975, 1976-1979, 1980-1981, 1982, and "don't know." The categorical responses were transformed into point estimates by taking the mid point of the interval category.
8. In rare instances of absolutely no debt or equity, total financial capital was set equal to one dollar when the log capital variable was created.
9. Similar to the year business acquired variable, responses to the question of employment experience were given in interval form: no experience, less than two years, 2-5 years, 6-9 years, 10-19 years, and "don't know." "Continuous measures were obtained by taking the midpoint of the interval.
10. The sample sizes drop slightly because owners failing to report years of employment experience are deleted.
11. It is conceivable that bankers weigh the risk of business survival in their loan size calculations. It is possible to test this hypothesis by incorporating into the lending equation in Section C.3 an estimate of the probability of discontinuance (as a proxy for business risk). To derive the probability of exit, the following logit model was estimated on the samples of black and nonminority construction firms:

$p_f = f$  (education, years of employment experience, family business ownership experience, log capital, leverage, business purchase, and year business acquired.)

The variable,  $p_f$ , was then entered as an explanatory variable into the loan size equation, along with education, owner age, startup equity, managerial experience, family business ownership experience, and business purchase. The results indicate that the coefficient on  $p_f$  is insignificant for whites, but negative and

weakly significant at the ten percent level for blacks. This suggests that bankers perceive that black construction firms are less viable and, hence, riskier operations than firms operated by their white counterparts. As a result, black construction businesses receive smaller loans.

12. The findings for nonminorities differed in that the years of employment experience variables were not statistically significant.

13. The 69 black bank borrowers analyzed in this study had a 27.5 percent discontinuance rate over the 1982-1986 time period, versus 24.0 percent among their nonminority cohorts. The black, white difference in discontinuance rates among the applicable nonborrower populations was very small, suggesting that capitalization equalization would possibly generate lower discontinuance rates among black firms than among nonminorities. The possibility - discussed at length in Bates (1991b), ch. 3 - is certainly not a foregone conclusion.